ATI Real Life Student Packet
N201 Nursing Care of Special Populations
2024

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ATI Scenario: Cystic Fibrosis (Scenario 2)

To Be Completed Before the Simulation

*****Blue boxes should be completed using textbook information. What do you expect to find? This information should be collected before you start the ATI simulation*

Medical Diagnosis: **Cystic Fibrosis**

NCLEX IV *(8)*: Physiological Integrity/Physiological Adaptation

Anatomy and Physiology
Normal Structures

Facilitates breathing, allows us to talk/smell, warms air to match body temperature, and moisturizes it to the humidity level your body needs, delivers oxygen to the cells in the body, removes waste gases, protects airways from harmful substances or irritants.

Thoracic Cavity

Divided into L and R pleural cavities separated by the mediastinum (includes the heart, aorta, lower trachea, large bronchi, esophagus, and hilum). Lined by pleura (2-layer membrane containing serous lubricating film). Diaphragm (muscle that aids in breathing)

Upper Airway

Nasal cavity/oral cavity: openings that pull in air from the outside. **Sinuses**: regulates the temperature of air, humidifying it as we inhale. **Pharynx/larynx:** delivers air from the mouth and nose to the trachea.

Lower Airway

Trachea: connects lungs to throat (carina separates upper respiratory from lower). **Bronchiole** tubes: tubes that branch off from the trachea into the lungs (splits at the carina). **Lungs**: separated into lobes (RL 3 LL2), lobes surrounded by pleura (thin sacs that separate lobe from the chest wall). **Alveoli**: tiny air sacs in the lungs where the gas exchange occurs, specifically the pores of Kohn (also where surfactant is produced). **Capillaries**: blood vessels within that facilitate gas movement.

Cilia: small hairs in the upper respiratory tract that catch pathogens. **Epiglottis**: tissue flap that covers trachea entrance when swallowing. **Larynx**: voice box

Mechanisms

Inspiration: diaphragm descends and flattens creating a negative intrathoracic pressure that causes air to move into the lungs
Expiration: passive process, when the diaphragm relaxes, and the elastic recoil causes the lungs to expel air and pull the diaphragm to its resting position

Circulation

Pulmonary: carries deoxygenated blood away from the heart to the lungs, and returns oxygenated blood to the heart (process exchange by diffusion)
Bronchial: vascular supply to the lungs, how the lungs achieve oxygenated blood.

NCLEX IV *(7)*: Reduction of Risk

Pathophysiology of Disease

Cystic fibrosis is an inherited, autosomal recessive genetic disorder. It is caused by mutations in the **CF transmembrane regulator (CFTR) gene**, which provides the instructions for making the protein that controls the channel that transports sodium and chloride. Causing this illness to **alter the transport of sodium and chloride ions in and out of epithelial cells** by blocking their transport channels. Due to this, the **secretions** of the lung, pancreas, intestines, and other organ cells will be **thick and abnormally sticky**, causing the ducts to become plugged.

Cystic fibrosis affects the airways in both the upper and lower respiratory tracts. Due to the affected sodium and chloride channels, the **mucous of the respiratory tract becomes dehydrated and sticky**. This causes the cilia to become overwhelmed with mucous secretions, which then become adhered to the airways. This causes the bronchioles to become obstructed which causes **scarring, air trapping, and hyperinflation of the lungs.**

There is a **persistent, chronic airway infection** in these patients, characterized by **pseudomonas** (a gram-negative bacteria), which can lead to lung inflammation, narrowed airways, and a **decrease in lung function**. **Chronic bronchiolitis and bronchiectasis** are the initial lung disorders occurring, which over time may lead to pulmonary vascular remodeling, enlarged pulmonary arteries, pulmonary hypertension, and cor pulmonale.

In the endocrine and GI systems, mucous plugging of the pancreatic exocrine ducts leads to **pancreatic insufficiency**. This insufficiency may lead to atrophy, progressive fibrotic cyst formation, and loss of the pancreas's function. Within the GI tract, CF may also cause **GERD, gallstones, liver cirrhosis, portal hypertension**, and distal intestinal obstruction syndrome (**DIOS**).

Cystic fibrosis is also related to diabetes (**CFRD**). This is due to the underdevelopment of pancreatic islet cells in utero and the destruction of pancreatic islet cells throughout one's lifetime.

To Be Completed Before the Simulation

Anticipated Patient Problem: Ineffective Airway Clearance

Goal 1: The patient will maintain an open airway as evidenced by the normal depth and rate of respirations during my time of care.

Goal 2: Patient will exhibit efficient coughing techniques during the time of my care.

Relevant Assessments (Prework) What assessments pertain to your patient's problem? Include timeframes.	**Multidisciplinary Team Intervention** (Prework) What will you do if your assessment is abnormal?
Auscultate lung sounds Q4h, after coughing, and as needed.	Raise the HOB to a semi or high fowler's position, maintaining a HOB of 45 degrees or higher, throughout my time of care.
Assess respiratory rate, depth, and use of accessory muscles Q2h.	Encourage early and frequent ambulation PRN during my time of care.
Assess the quantity, consistency, color, and frequency of sputum after each productive cough.	Encourage the oral intake of fluids, averaging 100 ml/hr, PRN during my time of care.
Monitor oxygen saturation Q2h.	Suction nose, mouth, and trachea using correct size catheter and suction timing PRN during my time of care.
Assess methods and efficiency of coughing techniques PRN.	Encourage deep breathing and coughing exercises, including chest splinting, PRN during my time of care.
Assess for contributing factors of ineffective airway clearance including pathological manifestations PRN.	Administer expectorants, anti-inflammatory agents, bronchodilators, or mucolytic agents as ordered by the provider.

To Be Completed Before the Simulation

Anticipated Patient Problem: Imbalanced Nutrition: Less Than Body Requirements

Goal 1: The patient will verbalize the importance of eating proteins before other food groups on their plate during my time of care.

Goal 2: The patient will eat at least 50% of their lunch during the time of my care.

Relevant Assessments (Prework) What assessments pertain to your patient's problem? Include timeframes.	**Multidisciplinary Team Intervention** (Prework) What will you do if your assessment is abnormal?
Measure the patient's height and weight and ask about history of twenty-five-pound weight loss at the beginning of my time of care and PRN.	Establish short-term and long-term goals with the patient to focus on eating specific food groups even when not hungry PRN during my time of care.
Monitor laboratory values including serum albumin, transferrin, RBC, WBC, and serum electrolyte values that reflect nutritional status at the beginning of my time of care and PRN for new lab draws.	Administer multivitamins as ordered by the provider.
Assess the patient's food intake after each mealtime and PRN for snacks during my time of care.	Encourage the patient to drink their nutritional supplement as ordered.
Assess the patient for physical signs of poor nutritional intake including fatigue, episodes of confusion, tachycardia, and hypotension, and the beginning of my time of care and q4hr.	Offer the patient frequent small meals, including jello and pudding, that are high in calories PRN during my time of care.
Assess the environment in which eating occurs at the beginning of my time of care and during each mealtime.	Ensure a pleasant environment, ensuring a clean space free of trash and foul smells, throughout my time of care and PRN during mealtimes.
Assess the patient's favorite foods, asking them what textures of food they enjoy at the beginning of my time of care and PRN.	Encourage the patient's family to bring in food from local stores or from home PRN during family visits.

To Be Completed During the Simulation:

Actual Patient Problem #1: Impaired Gas Exchange
Goal: The patient's SpO2 levels will remain equal or greater than 92% on RA during my time of care.
Met: **X** Unmet:☐
Goal: The patient will have proficient oxygenation aeb the lack of accessory muscle use by the end of my time of care. Met: **X** Unmet:☐

Actual Patient Problem #2: Imbalanced Nutrition: Less than Body Requirements
Goal: The patient will demonstrate an understanding of a balanced diet aeb eating a meal containing food from each food group during the time of my care. Met: **X** Unmet:☐
Goal: The patient will eat at least 75% of their dinner during the time of my care. Met: **X** Unmet:☐

Additional Patient Problems:
#3 Deficient Fluid Volume
#4 Deficient Knowledge

Below will be your notes, add more lines as needed. **Relevant Assessments:** Indicate pertinent assessment findings. **Multidisciplinary Team Intervention:** What interventions were done in response to your abnormal assessments? **Reassessment/Evaluation:** What was your patient's response to the intervention?

Patient Problem (#)	Time	Relevant Assessments	Time	Multidisciplinary Team Intervention	Time	Reassessment/ Evaluation
Deficient Knowledge	1330	Hx of cystic fibrosis, with acute pulmonary exacerbation. Positive for Burkholderia cepacian.	1332	Donned gloves and gown. Educated on special precaution protocols, including the inability to freely visit common spaces in the hospital.	1335	"That's all right, I get it."
Deficient Fluid Volume	1400	Blood pressure 106/67.	1445	Administered dextrose 5% in 0.45% sodium Chloride with 20 mEq potassium chloride IV at 80 mL/hr.	1600	Blood pressure 110/64. Total output of 320 mL during my time of care.
Impaired Gas Exchange	1400	Temperature 37.9 degrees Celsius and HR 96. RLL opacity with pneumonia. WBC 19, neutrophils 76, and lymphocytes 24.	1500	Administered tobramycin 90 mg IV bolus as ordered by the provider. Administered gentamicin 130 mg IV bolus as ordered by the provider.	1600	Temperature 37.9 degrees Celsius, HR 94.
Impaired Gas Exchange	1415	Wheezing auscultated in anterior and posterior bilateral lungs. Productive cough. Barrel chest. Mild clubbing of fingers and toes. RR 26, Spo2 95%. Relaxed breathing, with no presence of accessory muscle use.	1430 1600	Notified RT of findings. RT performed chest physiotherapy and administered 0.83% Albuterol via nebulizer.	1615	Decreased wheezing in anterior and posterior bilateral lungs. Movement of mucous plugs. Productive cough. RR24, Spo2 95%. Relaxed breathing, with no presence of accessory muscle use.
Imbalanced Nutrition: Less than Body Requirements	1550	PEG tube placement for feedings was inserted this year due to inadequate weight maintenance. Weight 43.11 kg, below 25th percentile for BMI. Below 5% for height and weight percentile. New order of enteral formula bolus feeding of 300 mL once over one hour. Aspiration of gastric contents is of normal amount.	1630 1640	Administered 6 capsules of pancrelipase PO. Administered 300 mL bolus of enteral formula once over one hour, as ordered by the provider.	1730	"I want some real food. I haven't spoken to dietary; can you order my food?"

Imbalanced Nutrition: Less than Body Requirements	1730	"I want some real food. I haven't spoken to dietary; can you order my food?"	1740 1800	Ordered a dinner of fried chicken breast, pork and beans, corn on the cob, chocolate whole milk, and a candy bar. Administered 6 capsules of pancrealipase PO.	1900	100% of meal tray eaten.

To Be Completed After the Simulation

The orange boxes should be filled out with your simulation patient's actual results, assessments, medications, and recommendations

NCLEX IV *(7)*: Reduction of Risk

Actual Labs/ Diagnostics

Chest XR: RLL opacity with pneumonia, bronchial thickening, and dilation, increased mucous concentration.
Labs: WBC 19, neutrophils 76, and lymphocytes 24, increased lipase.
Growth Chart: Weight 43.11 kg, below 25th percentile for BMI. Below 5% for height and weight percentile.
Sputum Culture: results not shown during my time of care
*****Although not seen in this client, CF is diagnosed by the sweat chloride test, through the pilocarpine iontophoresis method.

NCLEX II *(3)*: Health Promotion and Maintenance

Signs and Symptoms

Wheezing, coughing, frequent pneumonia, failure to thrive, malnutrition, fever (37.9 degrees Celsius), HR 96, frequent cough (dry), mild clubbing of fingers and toes, weight loss, protein and fat malabsorption, and a low BMI.

NCLEX II *(3)*: Health Promotion and Maintenance

Contributing Risk Factors

- Having 2 parents who carry the abnormal CF gene.
- White
- Male

NCLEX IV *(7)*: Reduction of Risk

Therapeutic Procedures

Non-surgical
Chest physiotherapy
Supplemental O2 (to maintain o2 sat above 92%)

Surgical
PEG tube placement

Prevention of Complications

Chronic lung infections: pneumonia

*Although not seen in this patient, we may also see bone, sinus, and liver disease. In addition, CFRD may cause respiratory failure, cor pulmonale, pneumothorax, hemoptysis, liver failure, or bowel obstruction.

NCLEX IV *(6)*: Pharmacological and Parenteral Therapies

Medication Management

- Antibiotics (gentamicin 130 mg IV, tobramycin 90 mg IV)
- 0.83% Albuterol via nebulizer
- 6 capsules of pancrelipase PRN before meals and snacks
- Nutritional Supplementation (enteral feedings)
- Dextrose 5% in 0.45% sodium Chloride with 20 mEq potassium chloride IV at 80 mL/hr.

NCLEX IV *(5)*: Basic Care and Comfort

Non-Pharmacologic Care Measures

Coughing techniques, maintaining elevated HOB, encouraging intake of protein and high caloric balanced meals, special precautions to protect the patient, therapeutic communication with family, and genetic counseling for families.

NCLEX III *(4)*: Psychosocial/Holistic Care Needs

Stressors the client experienced?

- Feeling of lost control
- Relationship with food, not liking PEG tube and wanting real food.
- Frequent hospitalizations
- Anxious parents

Client/Family Education

Document 3 teaching topics specific for this client.

- Importance of continuing at-home chest physiotherapy exercises.
- Purpose and importance of adhering to special precaution protocols.
- What a balanced meal looks like, and the importance of choosing these meals.

NCLEX I *(1)*: Safe and Effective Care Environment

Multidisciplinary Team Involvement

(Which other disciplines were involved in caring for this client?)

Primary nurse, dietary, pharmacy, respiratory therapy, and patient care techs.
*We may also see the physician, physiotherapy, OT, and psychology involved in this patients care.

Patient Resources

- Resources on genetic counseling and the likelihood of future children developing CF were given to the parents.
- Although resources were not given to the child, we can offer resources on support groups, nutritional counseling, and at-home treatments (this was mentioned during the simulation) for these patients.

Reflection Questions

Directions: Write a reflection including the following:

1. What was your biggest "takeaway" from participating in the care of this client?
   Upon completing this simulation, my biggest takeaway was the involvement of a pediatric patient's family in their care. As I have only worked with kids once in a healthcare setting, during the pediatric flu clinic, I have not had much experience caring for a pediatric patient. This simulation provided examples of the important role a child's family has in their care, including being an accurate historian and providing details of the child's progressing condition.

2. What was something that surprised you in the care of this patient?
   While caring for this patient, the boy's perception of his illness surprised me the most. Although he was diagnosed and actively battling recurrent respiratory infections, he was cheerful throughout his hospitalization. It surprised me to see how resilient he was, despite having recurrent hospital stays. I am not sure how I thought he would react, but I didn't imagine he would be as optimistic as he was.

3. What is something you would do differently with the care of this client?
   If I were to complete this simulation again, I would have chosen a different meal tray for him. Originally, I had chosen for him to eat the cheeseburger, tater tots, skim milk, and a snack. However, the correct meal tray of choice would have been fried chicken breast, pork and beans, corn on the cob, chocolate whole milk, and a candy bar. I did not think to choose this option as I had assumed the fried chicken would be too unhealthy. However, with reflection, I realized that the fried chicken meal was more balanced in food groups than the cheeseburger meal.

4. How will this simulation experience impact your nursing practice?
   In my future practice, this simulation will remind the importance of interprofessional care. Throughout the simulation, the primary nurse delegated tasks appropriately and continuously asked for help with the patient's care. I think her delegation was done correctly each time and showed her greater interest in the patient's care. This inclusion of all healthcare members in the care of the patient is something that I will continue to take with me.

5. Discuss norms or deviations of growth and development that was experienced during the simulation, including developmental stage.

   During this developmental stage, the adolescent, a child is beginning to grow within their own identity. They tend to modify their self-image, explore their sexuality, conform their behaviors to be accepted by their peers, and have increased narcissism. During this stage, their relationship with their parents is also at the lowest. However, this child during the simulation did not fit these norms of growth and development. Due to their frequent hospitalization and the contact precautions that needed to be taken for their care, this child is unable to socialize with their peers or any children close in age. In addition to this, the child seems to be extremely close with his family, who is involved with their care. This deviates from the typical growing apart from the family that occurs during this age.